make a tool to plane this piece. First, a good big fire, not too hot. Not too much blast, but just enough. Heat the steel evenly, being careful to have no part at any time too hot. Let the blows, which are required to shape the blade of the tool, be so delivered as to cause no more violent distortion of the metal than is necessary, and continue the hammering until the heat is sufficiently low to insure a thoroughly condensed condition, which cannot be secured if the hammering ceases while the steel is still yellow hot.

Now for hardening. Heat slowly and with great care to have the extreme point of the tool not quite as hot as it is further up. Heat the blade hot enough to harden for its entire length. Let the heat be the lowest that will produce a sufficient degree of hardness. Plunge the blade into cold water clear up to the shank. Don't hold it still in the water while it is cooling. Move it about, to bring it in contact with a fresh body of cold water in place of that which becomes instantly warmed by contact with the heated steel. If the degree of heat is right, you cannot cool the tool too quickly. Now souse it in all over. No need of keeping heat enough in the shank to draw the temper, as, for cutting this extremely hard piece of steel, the temper of the tool must not be drawn.

We (continues the "American Machinist") give this tool to the same man who said, twenty minutes ago, that no tool in the shop would cut the piece on which he had spent hours, and hardly made a mark. With an incredulous smile, he grinds and sets this tool and starts the planer, and, with not the slightest difficulty, this tool is fed down through the glazed surface to a cut at the deepest point of $\frac{1}{16}$in., or more, and, with the feed thrown in, it marches along as steadily as any ordinary tool would do in planing soft steel or cast iron. It is cutting clean—no glazing; no dodging in and out, leaving great ugly hummocks.

Why does this tool act so? Because it is enough harder than the piece it is cutting, so that it does not become dull at once, and has sufficient tenacity to stand the strain without breaking. And we have what? Simply a tool which makes it possible to plane this hard piece of steel, when it was impossible before? Aye! that, and more. We have a tool which may be ground and re-ground till it is worn clear to the shank, and which is not only better on hard work, but will prove better on all ordinary work, just in proportion as it is possessed of greater hardness and tenacity, and fineness of grain and consequent fineness of edge, than is possessed by the ordinary tool, which must have the temper drawn to prevent breaking.

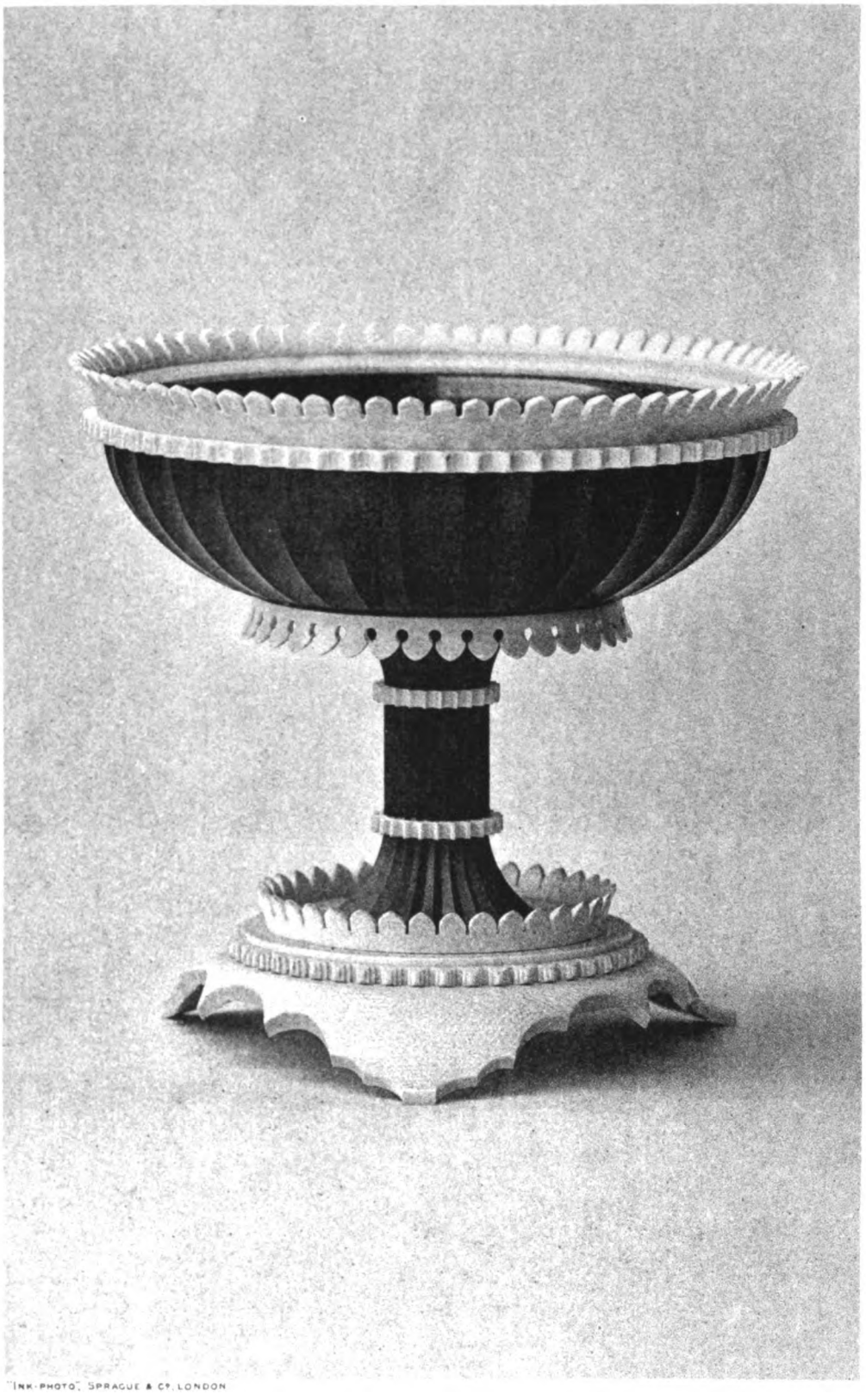
Employers, give your tool dressers time to do good work. Five minutes' time saved in the dressing of a tool often makes five hours' loss of time in the machine shop. Tool dressers, you who feel overburdened with work, make for yourselves an easy job, by making tools which will last to do ten times as much work. If you use charcoal, don't be too saving of it. A good body of coal and moderate blast should be the rule. If you use bituminous coal, bank up well with fresh coal, but let your heating steel only come in contact with that which is well coked. Don't let all hands and the apprentice boys from the machine shop dip into your fire to harden all sorts of tools. Don't let some old machinist taunt you with the fact that he has a chisel, or some other tool, that he has kept for years to do special work that can be done with no other tool, without showing him that you can make tools equally as good or better. And you can, if you will take time. Try it.

TAZZA IN BLACKWOOD AND IVORY.

(For Illustration, see Lithograph Supplement.)

The accompanying lithograph shows a nice specimen of ornamental turnery, in which fluting and drilling are both utilised to render the design. The photographer shows so clearly the form of the tazza, and as it may be made to any dimensions, any special description is hardly called for. The original from which the illustration was taken was executed by General Clarke, in the style which he has practised so successfully. Several specimens of the General's ornamental turnery have been published in former issues, and in each case some particulars of the mode of manufacture have been given from the pen of a skilled artificer.—The present illustration must be allowed to speak for itself.

What Paint Best Protects Iron?—Among the things that require the most protective paint for iron are carriages, farm wagons, ploughs, and agricultural implements, from which fact it seems feasible that manufacturers of the like ought to be able to give the best information required. Any mineral paint would answer the purpose much better, and I maintain that the paint that most effectually protects iron is red lead. Not in colour is it as well suited; but that is only a secondary consideration, and easily overcome by painting it over with any colour desired. It contains the following advantages for the preservation of the iron, which is the main object to be gained:—(1.) Dries easily with raw linseed oil, without an oil-destroying drier. (2.) After drying, it remains elastic, giving way both to the extension and contraction of the iron, without causing the paint to crack. (3.) It imparts no oxygen to iron, even when constantly exposed to damp—a fact to which all farm wagon makers can testify. (4.) It hardens, where it has been spread thickly, without shrivelling, forming the toughest and most perfect insoluble combination of all paints. As proof of this assertion, it is used by calico printers for red figure prints, holding out against soap and water; by gas pipe fitters, as the best paint to resist ammonia and tar; by the English iron ship builders, for painting the hulls of iron ships, namely, two coats of red lead and two of zinc white; by wagon and plough makers, for painting wagon gears and ploughs; by knowing carpenters, for painting wood that comes in contact with damp brick in walls, as it preserves wood from rot, insects, etc. For those among us who are uninstructed how to mix pure red lead for paint, it should be made known that pure red lead powder, after being slightly pressed down with the finger, shows no lead crystals. When they are visible, it is merely partly converted, and not first quality. It should be ground in pure, old linseed oil, and if possible used up the same day, to prevent it combining with the oil before it is applied, losing in quality. No drier is necessary, as in the course of a few days the oil forms a perfect hard combination with the lead. American linseed oil is as good as any imported, where the manufacturer has given it age, and not subjected it to heat, as is the custom, by steaming it in a cistern, to qualify it quickly for the market. It deteriorates in quality when heated above 160 F. This red lead paint spreads very easily over a surface, and the best of finish can be made with it, even by a novice in painting.



TAZZA IN BLACK WOOD AND IVORY.